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ABSTRACT

This study used current data from a cohort of eighth graders in the National Education Longitudinal Study of 1988 to test whether dropping out of high school and other measures of educational performance and involvement influenced the likelihood of having a school-age birth for whites, blacks, and Hispanics. Three major sets of independent variables were included, family-level (race/ethnicity, socioeconomic status, family size, intact family, mother's age at first birth); school-level (school type, percent minority, percent low income); and individual level (sex education, school performance, involvement in school activities, retention in grade, dropout status). Findings indicated that black females were more likely to have school-age births than Hispanics or whites, but were not more likely to drop out of school. Hispanics had the highest dropout rates. A set of proportional hazards models supported an opportunity-cost approach for predicting school-age motherhood; for all racial/ethnic groups, high educational performance, school involvement, and aspirations were associated with postponing motherhood. Among whites and Hispanics, dropouts, especially young dropouts, were more likely to become school-age mothers, apart from other family and educational factors. While African American teens did not show a relationship between dropping out of school and the risk of motherhood, school-level factors were important predictors of having a school-age birth for this group. (Contains 54 references.) (Author/KB)

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BREAKING THE CYCLE OF DISADVANTAGE: TIES BETWEEN EDUCATIONAL ATTAINMENTS, DROPPING OUT AND SCHOOL-AGE MOTHERHOOD

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BREAKING THE CYCLE OF DISADVANTAGE: TIES BETWEEN EDUCATIONAL ATTAINMENTS, DROPPING OUT AND SCHOOL-AGE MOTHERHOOD

ABSTRACT

Using contemporary longitudinal data from a cohort of eighth graders, several family and school factors, including family-school interactions, were shown to be associated with the risk of school-age motherhood. The paper specifically tested whether dropping out of high school, or other measures of educational performance and involvement, similarly influenced the likelihood of having a school-age birth for whites, blacks, and Hispanics. A set of proportional hazards models supported an opportunity cost approach for predicting school-age motherhood; for all racial/ethnic groups, high educational performance, school involvement, and aspirations were associated with postponing motherhood. Among whites and Hispanics, dropouts -- especially young dropouts -- were more likely to become school-age mothers, net of other family and educational factors. While African American teens did not show a relationship between dropping out and the risk of motherhood, school-level factors were important predictors of having a school-age birth for this group.

Political pressures surrounding the issue of teenage motherhood have recently accelerated in Congress and in the media. The debate over how to address the unusually high U.S. teenage birthrate is fueled by often conflicting concerns about rising rates of nonmarital births and abortion rates in the United States. The teenage birth rate, which declined in the U.S. during the 1960s and 1970s, has shown a sharp rise since the mid-1980s, especially among school-age mothers. Between 1986 and 1991, births to 15- to 17- year olds rose from 30.5 to 37.8 per 1,000 females, and remained constant in 1992 (Moore, Snyder & Glei 1995). The U.S. teenage birthrate remains substantially higher than birthrates in comparable industrialized countries.[1]

This paper focusses on the family and the school as two social institutions that are central socializing forces in the early life-course, and which may influence teenagers' educational attainments and their risk of dropping out, as well as their likelihood of becoming school-age mothers. Using contemporary longitudinal data, the paper identifies important antecedents of school-age motherhood and thus illuminates possible protective factors in the family and school that are associated with staying in school and delaying childbearing. This study considers the roles of school labels, school behavior, and aspirations on teenage motherhood by employing an opportunity cost framework to link academic achievement and aspirations to the likelihood of having a school-age birth.

This research specifically considers the influence of dropping out of high school on teenage motherhood, and tests whether dropping out, or other measures of educational performance and involvement, have a similar influence on school-age motherhood among white, black, and Hispanic females. It builds on recent research using event history models (Upchurch and Mcarthy 1990) to examine the temporal ordering of life events in order to model the influence of dropping out on school-age motherhood. Data from the National Education Longitudinal Study of 1988 (NELS:88) are used to address two sets of research questions in this paper:

1) What family, school, and individual characteristics are associated with an increased risk of school-age motherhood? What "protective" factors are associated with teens who postpone childbearing? Do these factors differ by race/ethnicity?
2) What is the relationship between dropping out of school and school-age motherhood; are dropouts more likely to become teenage parents? Does the influence of dropping out on having a teenage birth differ by age or race/ethnicity?

BACKGROUND

The following sections present a brief overview of research identifying individual-, family-, and school-level antecedents of school-age motherhood, including a discussion of the relative influence of educational attainments and the timing of motherhood.

Dropping Out and Teenage Motherhood

On average, teenage mothers have lower levels of educational attainment than other women; however, there has been some debate regarding causal linkages between educational attainment and fertility (Luker 1991). During the 1970s and early 1980s, a number of studies

explored the relative influence of educational attainment and the timing of motherhood. Most of this research showed a strong influence of educational attainment and aspirations on age at first birth, with a smaller causal effect of age at first birth on subsequent educational attainment (Hofferth & Moore 1979; Marini 1984; Rindfuss et. al., 1980).[2] While this research was innovative, subsequent institutional changes in school-level policies, including the passage of Title IX in 1972[3] and programs targeted to at-risk teens, may have altered the association between dropping out and school-age motherhood (Upchurch and McCarthy 1989).

More recent studies of the relationship between teenage motherhood and educational attainment use multiple methods to look primarily at the educational consequences of age at first birth. These studies can be broken down into categories of a) sibling fertility models, which control for variation across families and yield mixed results about the effects of teenage parenthood on educational attainment (Geronimus & Korenman 1992; Hoffman, Foster & Furstenberg 1993); b) studies that control for the endogeneity of educational attainment and teenage motherhood and argue that there may be underlying opportunities that jointly influence decisions about education and fertility (Klepinger, Lundberg & Plotnick 1995; Moore et. al., 1993; Olsen & Farkas 1989; Ribar 1993); and c) studies of the relative timing of first birth, dropout, and high school completion which yield mixed interpretations of the influence of having a teenage birth on dropping out of school or completing high school (Anderson 1993; Upchurch & McCarthy 1990). Most recent studies have found small or insignificant effects of age at first birth on high school completion, after controlling for background factors.

While there has been substantial research and debate over the educational *consequences* of a teenage birth, there has been limited research on the educational *antecedents* of school-age motherhood (Scott-Jones 1991). In one recent paper that considered educational antecedents of age at first birth, Moore et. al. (1993) found that educational attainment (years of schooling by age 27) was negatively related to age at first for black, Hispanic, and white females, while age at first birth influenced educational attainment only among Hispanic females. In another paper, Yamaguchi & Kandel (1987) found that dropping out of high school was associated with an increased likelihood of a premarital pregnancy among a 1970s cohort of high school students from New York schools. Many of the studies that examined educational correlates of having a teenage birth retrospectively tested whether final educational attainments influenced age at first birth and did not consider whether the relative timing of teenage motherhood and dropping out may have influenced their likelihood of completing high. Part of the reason that teenage mothers have lower educational attainments than other women may be because they had a birth after they already dropped out and were disengaged from the school system (Upchurch & McCarthy 1990). In fact, Upchurch (1993) indicated that among a sample of teenage mothers, those who dropped out prior to pregnancy were the most disadvantaged subgroup and may have seen motherhood as an alternative pathway to adulthood. The combination of limited research on educational antecedents of teenage motherhood, along with the especially disadvantaged status of teens who drop out prior to pregnancy, demonstrates a need to more carefully explore whether fertility may result from educational disengagement, specifically from dropping out of high school.

In addition, several earlier studies combined racial and ethnic groups into one set of models and did not explore further whether the relationship between educational attainments and age at first birth was similar for specific racial/ethnic groups. The recent rapid growth of the Hispanic population in the U.S., coupled with generally lower educational attainments among this subgroup, makes separate analyses by Hispanic origin an important methodological strategy (Forste &Tienda 1992).

Individual-, Family-, and School-level Characteristics

An opportunity cost approach to teenage motherhood leads to the hypothesis that girls who are performing well and engaged in school have greater opportunity costs associated with teenage motherhood than other girls (Moore, Simms and Betsey 1986). Teens with high educational achievements and plans to continue with schooling are less likely than other teens to be sexually active, more likely to use contraception, and more likely to abort an early pregnancy (Abrahamse et. al., 1988; Ohannessian & Crockett 1993; Thornton & Camburn 1987). Girls with fewer academic ties and lower future aspirations may be more likely to drop out of high school and to drift into having an early birth than other girls.

There are conflicting accounts regarding how often early parenthood is a conscious choice among teenagers, especially because of high reported rates of unintended teenage births. However, some researchers suggest that early motherhood may be a different type of "status" attainment -- for certain girls who have constrained choices, early motherhood is one way to achieve the status associated with womanhood (Burton 1990; Furstenberg 1991). There has been limited empirical evidence linking an opportunity cost hypothesis to the likelihood of having a school-age birth. Some recent research also suggests that an opportunity cost framework may be more appropriate for white adolescents than for blacks or Hispanics (Duncan & Hoffman 1990; Sugland 1992).

In an extensive review of the literature on adolescent pregnancy and childbearing, Moore, Miller, Glei, and Morrison (1995b) report that many aspects of the family affect early childbearing, including parental education and income, family structure, and religiosity. A status attainment framework posits that family socioeconomic status (SES) influences the age at first birth through individual educational attainments and preferences. Higher SES families generally are more able to provide conducive learning environments than other parents and offer greater cultural and material resources to facilitate involvement in their children's education (Clausen 1986; Lareau 1989).

Single mothers, families with several children, and teenage parents may exert less control and have fewer resources available to influence their adolescents' educational performances and sexual activity than other families (Downey 1995; Hogan & Kitagawa 1985; McLanahan & Bumpass 1988). Teens who grow up with single parents have more behavioral problems in school, may initiate sexual intercourse at earlier ages, and may have an earlier age at first birth (Furstenberg et. al., 1987). Daughters of teenage mothers are more likely to become teenage parents themselves (Kahn & Anderson 1992). While family risk factors

negatively influence adolescents' outcomes, other protective factors, including family encouragement, cognitive stimulation, and positive aspirations for children's school success have a positive effect on educational outcomes and reduce the risk of a teenage birth (Dubow and Luster 1990; Moore & Snyder 1991). Maternal aspirations and parental involvement in their child's education, even at an early age, strongly reduce a teen's likelihood of dropping out or having a teenage birth (Brooks-Gunn, Guang & Furstenberg 1993; Manlove 1993).

School-level processes that influence educational performances and aspirations may also influence the risk of having a teenage birth. For instance, the type of school that a teen attends may contribute to her educational outcomes and risk of teenage parenthood. High-income schools, as well as Catholic and private schools, have more resources, curricula oriented to higher achieving students, and students with higher levels of performance who are less likely to drop out or possibly become teenage mothers than other schools (Lee & Bryk 1988; Mayer 1991). Alternatively, students who attend schools with a high percentage of school-age mothers or disadvantaged students may be in a context that provides role models for early motherhood. School-level factors may also mediate the influence of family background on fertility. The influence of attending different types of schools on educational and fertility outcomes varies by students' SES or race/ethnicity (Mayer 1991; Crane 1991). For instance, Bryk & Thum (1989) found that at-risk youth especially benefit from attending schools that emphasize academic involvement and have engaged teaching staff, while Brooks-Gunn, Guang, & Furstenberg (1993) found that black students attending racially diverse schools had a reduced risk of dropping out. Specific programs within schools, such as sex education classes targeted to preventing teenage pregnancy, may also influence the risk of having a school-age birth. There has been some debate about whether sex education classes reduce the risk of school-age motherhood by teaching sexually active teens how to effectively use contraception, or whether sex education encourages early or non-marital sexual activity and increases the rate of school-age parenthood (Moore et. al., 1995b).

Girls who are discouraged in school may have fewer opportunity costs associated with having a school-age birth. One source of discouragement may be the result of early negative educational labels from teachers and schools, which follow children through their educational careers and influence their subsequent attainments (Entwisle & Hayduk 1988; Kerckhoff 1993). An extensive body of literature documents the inequitable influence of ability grouping and curricular tracking on educational outcomes, especially among minority and low-income students who have been over-represented in low ability groups (see Gamoran & Berends 1987; Slavin 1990 for reviews). Placement in a low ability group is associated with losses to achievement and lowered aspirations, largely as the result of lower instructional quality (Oakes et. al., 1992). Alternatively, positive educational labels may be associated with greater involvement in education, positive perceptions of educational and work opportunities, and postponing childbearing.

DATA

This paper extends prior research by analyzing a contemporary cohort of high school students to compare the influence of family background, educational success, and dropping out of school on the risk of having a school-age birth. The data used in this study are from the National Education Longitudinal Study of 1988 (NELS:88), a nationally representative sample of students who were enrolled in eighth grade in 1988 and were reinterviewed in 1990 and 1992. In-school students were interviewed in each wave, and dropouts were interviewed at the first (1990) and second (1992) follow-ups. NELS:88 contains over-samples of Hispanic and Asian/Pacific Islander students. The sampling framework also incorporated students who attended public schools with large percentages of black and Hispanic students. The data provide rich information on both educational and family antecedents of school-age motherhood.

Family background, as well as school- and individual-level data for this study are taken from the base year study of individuals, parents, teachers, and schools. Event histories for time to first birth (age in months at first birth) and time to first dropout episode (age in months) were constructed from the first and second follow-up interviews of in-school students and dropouts. The panel sample was used for full event history coverage. Teens who reported they were pregnant at the time of the 2nd follow-up (N=169) were excluded from the study sample because they did not provide information on the age at first birth. Also excluded were those respondents who did not provide information on the date of first birth or first dropout (N=262).[4] The final sample of 7,918 students includes 587 teenage mothers. Panel weights were employed in all analyses.

Conceptual Framework

Figure 1 illustrates the conceptual framework for this paper. It incorporates a life-course perspective to show the influence of family background, school characteristics, and individual characteristics on the risk of having a school-age birth. Family background characteristics (including family-school interactions) and school factors exert both direct and indirect effects on the likelihood of having a school-age birth, and are hypothesized to operate, in part, through individual characteristics and dropout status. Below is a brief description of the variables used in these analyses. The appendix includes a more complete description of the variables.

(Figure 1 about here)

The study includes three major sets of independent variables: family-level (including family-school interactions), school-level, and individual-level variables (see Figure 1). All of these variables were taken from the base year. Family background variables include family race/ethnicity (non-Hispanic white, non-Hispanic black, and Hispanic of any race), SES (parental measure of family income, occupation and education), family size, and intact family. As a measure of mother's age at first birth, this study includes mother's birth cohort and parity of the study child. Families who reported no biological mother present were flagged and not

coded for age at first birth. Urbanicity and residence in the South are also included to control for possible regional variations in teenage motherhood and dropping out. Family-school interaction variables include parental involvement in their child's education and respondent's perception of her mother's aspirations for their post-secondary schooling.

School variables shown in Figure 1 include mathematics ability group location, school type (including Catholic or private school, percent minority, and percent of students receiving free lunches). In addition to these school variables, schools that have 50% or more single mother families may provide an indicator of a context which is supportive of early or nonmarital parenthood. Students who took one or more sex education classes per week were also flagged.

The individual characteristics outlined in Figure 1 include measures of school performance and involvement in school activities. Measures of school performance include grades and test scores in eighth grade. Teacher ratings may capture both a student's actual performance and a teacher's perception of her performance. Level of involvement in schoolwork is measured by hours spent doing homework and post-secondary education plans. Religious involvement is measured by whether or not girls were involved in a religious club at school.[5] Finally, school retention in grade and whether or not a student had dropped out are also included.

Dropout status is measured in two ways: 1) whether or not the teenager had dropped out either before pregnancy or before the study ended, and 2) as a time-varying measure of age in months when dropout occurred. Two time-varying measures are included to examine whether age at dropping out and/or duration of time since dropping out are related to the risk of school-age motherhood. Dropouts are defined in NELS:88 as individuals who, during the Spring of 1990 or 1992, according to the school and/or home, had not been in school for four consecutive weeks or more and were not absent due to accident or illness (NCES 1994).[6]

The appendix includes variable means for family, school, and individual characteristics by race/ethnicity, and demonstrates differences in backgrounds and social contexts of black, Hispanic, and white teens. For example, while black females were more likely to have school-age births (22.3%) than Hispanics (15.8%) or whites (7.3%), they were not more likely to dropout of school. Hispanics, however, had the highest dropout rates (11.7%) and also had relatively high rates of teenage parenthood (15.8%).

METHODS

This paper employs proportional hazards models to examine factors associated with the rate of transition to a first birth. The models are based on Cox's partial likelihood estimation, in which the baseline hazard is unspecified (Cox and Oakes 1990). Proportional hazards modeling produces unbiased estimates of parameters in the presence of censored data (Allison 1984). The hazard function is defined as:

$$h_i(t) = h_o(t) \exp[\sum_k b_k X_{ik}(t)]$$

in which $h_o(t)$ is the underlying baseline rate of transition to a first birth at time t and $X_{ik}(t)$ is the value of the kth covariate for person I at time t (Yamaguchi 1991). The proportional hazards models incorporate both time varying and non-varying characteristics associated with having a school-age birth. The dependent variable is age at first birth, measured in months. For individuals who had not had a birth by the last wave of the study (censored cases), the dependent variable is age at the time of the second follow-up.[7]

Design Effects

Because NELS:88 is a sample of eighth grade students who are clustered in a stratified sample of schools, the resulting statistics are more variable than they would have been if they had been based on data from a simple random sample (NCES 1994). All results presented in this paper include design effects to adjust standard errors and the significance of estimates, using SUDAAN, a statistical analysis package developed by the Research Triangle Institute.

Two sets of programs are used to model the influence of dropping out on the risk of having a school-age birth: survival models in SUDAAN and proportional hazards models in SAS. SUDAAN models control for design effects and allow for weighted data, but do not allow for time-varying covariates. SAS proportional hazards models are used to estimate models with time-varying covariates, but do not incorporate design effects. Because of this, tables presenting models using SAS include only the direction and significance of influence of time-varying dropout variables (age at first dropout episode and duration since dropping out) on the likelihood of having a school-age birth.

RESULTS

Characteristics by School-Age Motherhood

Figure 2 presents the weighted percentages of school-age births by race/ethnicity and prior dropout status. The first set of columns for each racial/ethnic group shows the percentage of that group who had a school-age birth by the equivalent of twelfth grade (four years after attending eighth grade). According to this figure, approximately 10% of female teens had a school-age birth. This differs dramatically by race/ethnicity, with the percentage of school-age mothers among blacks (22.3%) approximately three times the percentage of whites (7.3%) and the percentage of Hispanics in-between the other two rates (15.8%). The other two bars in each section present birth rates by prior dropout status. This table shows a strong association between teenage parenthood and dropping out; while 10.2% of all students reported having a birth by the 2nd follow-up, 41.0% of students who dropped out at some point (either before the study ended or before pregnancy) had a teen birth.[8] Hispanic dropouts had the highest percentage of school-age mothers (53.4%), while whites who stayed in school had the lowest percentage (5.5%). Both black dropouts (35.7%) and white dropouts (37.9%) also had high but comparable proportions of births. Note that the difference between the proportion of births among dropouts and continuously enrolled students for blacks (a 14.4 percentage point difference) is not nearly as high as that of the entire sample (a 32.9

percentage point difference), suggesting that blacks, irrespective of dropout status, had high percentages of teenage births.

(Figure 2 about here)

Table 1 presents the mean distribution of various family, school, and individual-level variables by race/ethnicity and parenthood status. This table shows strong significant differences in several background characteristics between school-age parents and teens who postponed having a birth. Among Hispanics and whites, school-age mothers were from lower SES families, on average, than girls who did not have a school-age birth. Family structure was also tied to teenage motherhood: school-age mothers were less likely than other girls to come from an intact family, irrespective of race/ethnicity. Among whites, teenage mothers were slightly more likely to come from a rural area, and among whites[9] and Hispanics, to live in the South. Black, white and Hispanic girls who became teenage mothers had parents who were significantly less involved in their education and, among Hispanics and whites, had mothers with lower aspirations for their educational future than other girls.

(Table 1 about here)

Teenage mothers also had significantly different school environments than other girls. For all racial and ethnic groups, school-age mothers were less than half as likely to attend a high ability math class in eighth grade than non school-age mothers, and among whites, significantly more likely to be in a low ability group. This suggests that teens labeled as high ability students (who receive the high status and curriculum associated with being in a high ability group) may by less likely to become teenage parents. Girls who became teenage parents were much less likely to attend a Catholic or private school than other students, but (except for Hispanics) not significantly more likely to be in a school with a large percentage (50% or higher) of children from single-mother households. Hispanic and white teenage mothers were less likely than other teens to attend low-minority schools (0-5%) or low SES schools (0-5% of students receiving free lunches). As of eighth grade, black and white teenage mothers were more than three times as likely to be rated as having low ability by both of their interviewed teachers than other students. Multivariate analyses will test whether negative teacher labels influence the risk of having a school-age birth, after controlling for other performance measures.

Individual-level variables indicate the appropriateness of an opportunity cost model for studying school age motherhood. Girls who postponed childbearing had significantly higher performance and levels of involvement in school activities, on average, for all racial/ethnic groups: they scored higher on achievement tests, had higher grades, and (among whites and Hispanics) spent significantly more time on homework than girls who become teenage mothers. Additionally, a sizeable percentage of the girls who became teenage mothers (27.0% of blacks, 39.8% of Hispanics, and 34.6% of whites) had been retained in school at some point before eighth grade. Girls who postponed parenthood had significantly higher academic

aspirations than girls who became teenage mothers. Membership in a school religious organization is also associated with postponing childbearing among Hispanics and whites, but not for blacks. In general, girls who were performing well in school and planning to continue their academic careers were less likely to become teenage parents than other teens.

Table 1 also demonstrates a strong relationship between dropping out of school and becoming a school-age mother, among Hispanics and whites. Over a quarter of white teenage mothers (29.9%) and an even higher percentage of Hispanic teenage mothers (39.4%) had dropped out of school prior to conceiving; in comparison with only 3.8% and 6.5% of white and Hispanic teens who postponed childbearing. However, only 10.5% of black teenage mothers had dropped out prior to conceiving, which is not significantly different from the 5.4% of black teens who didn't have a birth. This suggests that dropping out of school doesn't have as much of an influence on becoming a school-age mother for blacks as for girls of other racial or ethnic groups. Because there are significant racial/ethnic differences in the likelihood of having a school-age birth, and because the sample means suggest that the influence of dropping out on having a birth differs by race/ethnicity, all models are run separately for whites, blacks, and Hispanics.

Factors Influencing Time to a First Birth, by Race/Ethnicity

The results of the proportional hazards models predicting risk of school-age motherhood are reported in Tables 2 and 3. The reported coefficients are the transformed betas, e^{bi}, representing relative risks comparing one category of a variable with its omitted category. For dummy variables, the excluded categories have a coefficient of 1.00. A coefficient that is greater than one represents a greater likelihood of having a school-age birth, while a coefficient of less than one represents a reduced risk of becoming a teenage mother.

Table 2 presents the results of proportional hazards modeling for blacks, Hispanics, and whites in order to determine the relative influence of family, school, and individual characteristics on the risk of school-age motherhood, by race/ethnicity. The models are presented in a sequential order, with the first model (1) including family background and school-level factors, the second (2) adding teacher ratings and individual variables, and the third (3) adding dropout status for each racial/ethnic group.[10] Because of the smaller sample sizes for blacks (N=785) and Hispanics (N=971), this section examines the direction as well as the significance of effects. Z-tests are performed on critical betas to test whether the size of effects is significantly different for whites, blacks or Hispanics.

(Table 2 about here)

For each racial/ethnic group, Model 1 includes several family background variables which significantly influence the likelihood of having a school-age birth. After controlling for parity, mother's age (represented by her birth cohort) has a significant negative influence on the risk of early motherhood for whites and blacks (although this is significant at the .10 level for blacks). This indicates that daughters of women who had births at an early age are more

likely themselves to have a school-age birth. Parity is also associated with the risk of motherhood for Hispanics and whites, with higher birth order females more likely to have a school-age birth, even after controlling for family size. A flag for non-biological mothers (who were not coded on birth cohort) shows that among blacks, teens living with non-biological mothers are more than five times (5.67) as likely to become school-age mothers than teens who reside with their biological mother. The comparable coefficient for whites (3.76) is also high, and, although the influence of not residing with a biological mother is not significant among Hispanics, this coefficient is also high (2.18).

Family structure and family SES are also associated with the risk of having a school-age birth for all racial/ethnic groups. Higher family SES has a significant negative effect on the likelihood of having a teenage birth for Hispanic and white teens and a non-significant positive effect for blacks. After controlling for other family characteristics, larger family size is associated with an increased risk of becoming a school-age mother among Hispanics. For all racial/ethnic groups, living in an intact family in eighth grade is associated with a significantly lower risk of becoming a school-age parent. For instance, white teens residing in an intact family are only half as likely as teens in other family situations to have a school-age birth. Urbanicity and location in the south are not significantly associated with the risk of motherhood, after controlling for other family background characteristics.

Family-school interactions show significant effects on school-age motherhood for all respondents. In Model 1, parental involvement (for blacks and whites) and high maternal aspirations (for Hispanics and whites) reduce the risk of having a school-age birth, even after controlling for other family characteristics. These effects suggest that parental involvement in school and high parental goals may serve as a protective factor against early motherhood.

Location in a high ability group is associated with postponing childbearing; black and Hispanic teens in high ability groups in math class have only about four-tenths the odds of becoming school-age mothers as girls in ungrouped classrooms. A contrast between girls in low versus high ability group math classes is also significant for blacks and Hispanics.[11] The type of school attended also influences the risk of an early birth. Black teens who attend Catholic or private schools have much lower odds of becoming teenage parents (only 14% as likely) as blacks who attend public schools. Attending a Catholic or private school has no significant influence for Hispanic and white students, however (Z-tests show a significant difference in the size of effects between blacks and whites, but not between blacks and Hispanics). While attending sex education classes one or more times a week is associated with a lower risk of having a school-age birth for Hispanics,[12] attending sex education classes is associated with a greater likelihood of having a school-age birth among blacks. This may be because African Americans are more likely to attend schools that are perceived as at-risk and offer a broader range of programs, including sex education.

School context influences the risk of school-age motherhood in some cases. For instance, attending a school with 0-5% minority students is significantly associated with a

reduced likelihood of becoming a school-age mother among white students only, although the size of the coefficient is similar for Hispanics.[13] Neither school SES, as measured by percentage of students receiving free lunches, nor attending a school with a high percentage of single-mother families is significantly associated with the likelihood of motherhood for any racial/ethnic group, after controlling for family background and other school-level characteristics. Family background and school characteristics explain a higher proportion of the variance in the timing of motherhood for whites (adjusted $X^2=76.85$) than for Hispanics (adjusted $X^2=58.16$), and considerably more than for blacks (adjusted $X^2=24.18$).

Model two adds teacher ratings and individual characteristics, which help explain the risk of school-age motherhood for blacks, Hispanics, and whites. These variables demonstrate a strong relationship between high educational performance, involvement in school activities, and postponing a first birth among all racial and ethnic groups. Black females with low ability ratings by two teachers in eighth grade have over twice the odds of becoming teenage mothers as other teens, even after controlling for their grades and test scores. The size of this effect is significantly different from the size for Hispanics or whites, suggesting that negative teacher labels may have an especially strong influence on risk behaviors among black teens.[14]

School performance and involvement in school are highly related to the risk of school-age motherhood: high grades (for blacks and whites), high test scores (for all groups) and time spent doing homework (for Hispanics) all reduce the likelihood of a school-age birth. Black and Hispanic teens with high post-secondary educational ambitions have lower risks of becoming teenage parents, net of their school performance, indicating that aspirations are an important component of preventing early motherhood.[15] Finally, involvement in a religious group has a significant negative influence on the risk of an early first birth for whites only (although the effect is in the same direction and does not have a significantly different size for blacks or Hispanics).

The addition of teacher ratings and school involvement in Model 2 alters the effects of some of the family background and school-level variables on the risk of motherhood. For instance, after controlling for teacher ratings and school performance and involvement, the non-significant effect of family SES on the risk of a school-age birth for blacks becomes a significant *positive* effect.[16] The effect of SES on the risk of a school-age birth becomes non-significant for whites, indicating that the influence of family status on the likelihood of motherhood operates through educational performance and involvement. For Hispanics, however, location in a middle ability group is associated with a greater risk of having a teenage birth.[17] A contrast between high and low ability groups also remains significant for Hispanics, even after controlling for test scores and grades; therefore, the influence of ability grouping on the risk of motherhood is stronger for Hispanic students than for other students. Adding teacher ratings and individual involvement in school to the second set of models increases the explained variance among blacks and Hispanics so that the adjusted X^2 is similar for all racial and ethnic groups.

Model 3 tests the influence of dropping out of school on the risk of school-age motherhood, after controlling for family background and individual performance in school. Note that among teenage mothers, dropouts are identified only if they dropped out prior to pregnancy. There is a significant positive effect of dropping out of school on the likelihood of having a school-age birth for Hispanic and white students. White dropouts have a 94 percent higher likelihood of having a school-age birth, while Hispanic dropouts have more than two times the risk of becoming school-age mothers. Blacks who drop out are not significantly more likely to become school-age mothers than blacks who remain in school.[18] Thus, while school attainments and aspirations are strong protective factors for all racial/ethnic groups, dropping out is not a factor that increases the risk of school-age motherhood for blacks. Perhaps this is because black dropouts are more likely, on average, to return to alternative GED programs than other dropouts (McMillen et. al., 1994), or to have more family supports to return to school than other teens, or because even enrolled black females have a high probability of having a birth.

The final models show several other significant variables that predict the likelihood of school-age motherhood. Family background factors have a continued, significant effect for all racial and ethnic groups, even net of all other family, school and individual factors. Coming from an intact family, either with both biological parents or with a biological mother, is a protective factor for all racial/ethnic groups, while having a mother who had an early first birth is a risk factor for blacks and whites. Family-school variables seem to operate through individual educational aspirations and attainments for blacks and Hispanics, while the influence of parental involvement on the risk of a school-age birth remains significant for whites.[19] The influence of school-level factors on the risk of school-age motherhood differs by race-ethnicity, with blacks being the most affected by school-level factors. For instance, among blacks, attending a Catholic or private school, taking one or more sex education class a week, and low teacher ratings are all related to the risk of motherhood. Ability grouping is the only significant school-level effect for Hispanics, while attending a low-minority school is the only school-level predictor for whites. For all racial and ethnic groups, higher levels of school involvement and educational aspirations are associated with a lower risk of having a school-age birth, net of other factors. These findings support an opportunity-cost approach to teenage motherhood.

Table 2 points to a number of possible protective factors in the family and school. It suggests that involving parents in their children's education is associated with postponing childbearing. Altering school-level policies of ability grouping, teacher encouragement, and providing additional school resources may better encourage the educational progress of at-risk students and reduce the likelihood of school-age motherhood. Finally, even after controlling for educational progress, keeping students in school is associated with a lower risk of having a teenage birth for both Hispanics and whites.

Time-Varying Dropout Variables

The nature of the influence of dropping out of school on the risk of teenage motherhood may be more complicated than the models in Table 2 imply. Table 3 examines the influence of the timing of dropping out, the duration of time since dropping out, and the age in years at dropout on the risk of having a school-age birth. This table reports the results of hazard models using time-varying covariates to predict the risk of motherhood, net of all other background factors. Because these models use proportional hazards models in SAS, which do not control for design effects, this table only reports the significance and direction of association between the dropout variables and teenage motherhood. In these models the time to dropout is a time-varying covariate which has a value of zero in months prior to any dropout spell and one in the month of dropout and for all other subsequent months. A duration variable measures the amount of time, in months, between dropping out and pregnancy or leaving the study. The final variable tests whether the influence of dropping out on the risk of having a teenage birth differs by age. The results are reported for the entire sample and by racial and ethnic groups.

(Table 3 about here)

Table 3 shows that, for the pooled sample, when dropping out is measured as a time-varying covariate, it has a significant positive influence on the risk of motherhood and that the influence of dropping out decreases with age (younger dropouts are more likely to become teenage mothers than teens who drop out at later ages). The duration of time since dropping out is not significant. Hispanics and whites exhibit similar patterns, but blacks show no significant association between any dropout variable and the risk of a school-age birth.

This set of models shows a strong positive relationship between dropping out and teenage motherhood for Hispanics and whites, especially among young teens. Table 2 shows that students who remain in school are less likely to become teenage parents, while Table 3 demonstrates that the longer students remain in school, the lower their risk of becoming teenage parents, even if they eventually drop out. Keeping at-risk teens in school as long as possible may thus reduce their risk of becoming teenage mothers.

DISCUSSION

The political debate surrounding teenage motherhood has recently focussed on punitive methods to prevent early pregnancy, for instance by denying welfare benefits to young mothers. However, the recent debate has not addressed the potentially important role of the school or positive perceptions of life opportunities as protective factors to reduce childbearing among teens. This paper suggests that school-level processes play an important role in influencing the risk of teenage motherhood, either through individual engagement in school, parent involvement in education, teacher encouragement, or structural aspects of the school. In general, the models presented in this paper support an opportunity cost approach to teenage motherhood for all racial and ethnic groups: girls who are engaged in school, who are performing well, and who stay in school have a lower risk of becoming teenage mothers than

other girls who may drift into early motherhood. This paper also demonstrates a strong, positive relationship between dropping out and school-age motherhood for current cohorts of white and Hispanic students, even after controlling for measures of educational performance. The results indicate that keeping students in school should be a goal, not just to improve academic success, but in order to help reduce the risk of school-age motherhood. The influence of dropping out on teenage parenthood is especially strong for young teens. Younger at-risk teens should thus be targeted for pregnancy prevention and dropout prevention programs.

The models suggest family stability represents a major source of protection against early motherhood for all teens. Family-school connections, in the form of either parental involvement in their daughter's school or mother's aspirations for her daughter's post-secondary schooling, are additional sources of protection for at-risk girls of all racial and ethnic backgrounds. Schools that encourage parental involvement, especially among disadvantaged parents, may thus improve the educational success of teens and reduce the risk of teenage parenthood.

While, in general, the models suggest the applicability of an opportunity cost approach for teens, protective factors associated with postponing a first birth show are different for black, Hispanic, and white teens. For instance, while high levels of school performance and positive educational aspirations are associated with a reduced risk of having a teenage birth among blacks, dropping out of school does not increase the likelihood of having a school-age birth for this subgroup. Black dropouts and black students have similarly high levels of school-age births. This suggests that there are other components of opportunities available to black teens that are not necessarily captured in this study. In addition, taking regular sex education classes increases the risk of a school-age birth for black teens. Sex education programs that are limited to conveying knowledge about reproduction and contraception may be missing an important component by not addressing the role of life opportunities in postponing motherhood.

Black teens also face possible barriers to educational performance and postponing early motherhood, because negative teacher labels disproportionately affect black teens, even after controlling for performance and dropout status. This implies that teacher encouragement and overall support of students may reduce the likelihood of teenage parenthood among at-risk students. Recent research on teacher initiatives indicates that teachers who are identified as leaders in parental involvement are less likely to label at-risk students and more likely to improve academic involvement of students and parents (Epstein 1990). Teacher involvement and school practices may thus play an important role in children's academic development and in reducing school-age motherhood among at-risk students. Attending a Catholic or private school reduces the risk of motherhood for black students. This corresponds to research that shows the added benefit to at-risk students of attending programs with committed faculty who emphasize academic outcomes (Bryk and Thum 1989). School programs that encourage opportunities for achieving status outside of motherhood may thus benefit at-risk students.

Among Hispanics, school performance, educational aspirations and dropout status all influence the risk of early motherhood. The effect of ability grouping on the risk of a school-age birth remains significant among Hispanic teens, even after controlling for educational performance, suggesting that being placed in a middle or low group instead of a high group is especially influential on outcomes among Hispanics. Thus, educational barriers, as well as opportunity costs, influence the risk of school-age motherhood for Hispanics.

Among white teens, educational performance and dropout status influence the risk of a school-age birth. However, educational aspirations are not associated with school-age motherhood for whites, suggesting that other factors may better measure opportunities for whites in this sample. In addition, white students involved in a religious organization at school are at a lower risk of having a school-age birth, demonstrating an association between religiosity and early motherhood. Whites who attend racially separate schools (0-5% minority) are less likely to have a teenage birth, suggesting that students who attend schools with greater resources and a less diverse student body may have greater opportunity costs associated with having a teenage birth.

Different measures of opportunities are appropriate for teens with different racial/ethnic backgrounds; however, this paper supports the finding that students who receive support from their families, encouragement in school, and who are involved in school activities may see educational and work opportunities that help reduce their risk of becoming school-age mothers. Educational involvement serves as a protective factor, while certain educational barriers -- such as labeling or ability grouping -- may increase the risk of teenage motherhood.

This paper also informs the debate about the educational consequences of teenage motherhood. Educational factors have a strong influence on birth outcomes. Part of the reason that teenage mothers ultimately have lower educational levels than other women, however, may be due to their disengagement from school prior to conception. Researchers interested in educational consequences of teenage motherhood should consider the relative timing and sequencing of life events, including school dropout and teenage motherhood.

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FIGURE 1. CONCEPTUAL FRAMEWORK: FAMILY, SCHOOL, AND INDIVIDUAL CHARACTERISTICS THAT INFLUENCE SCHOOL-AGE MOTHERHOOD

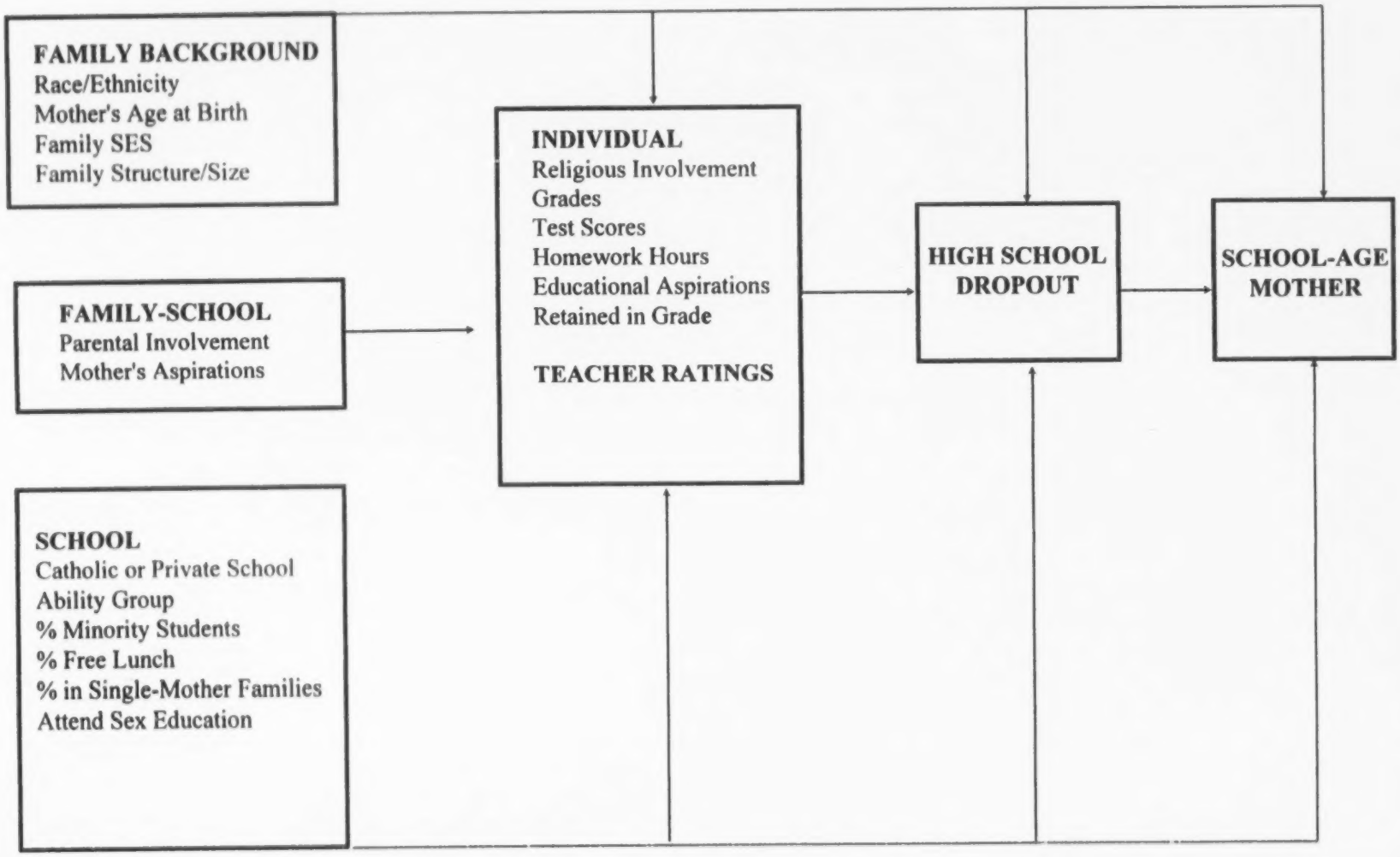
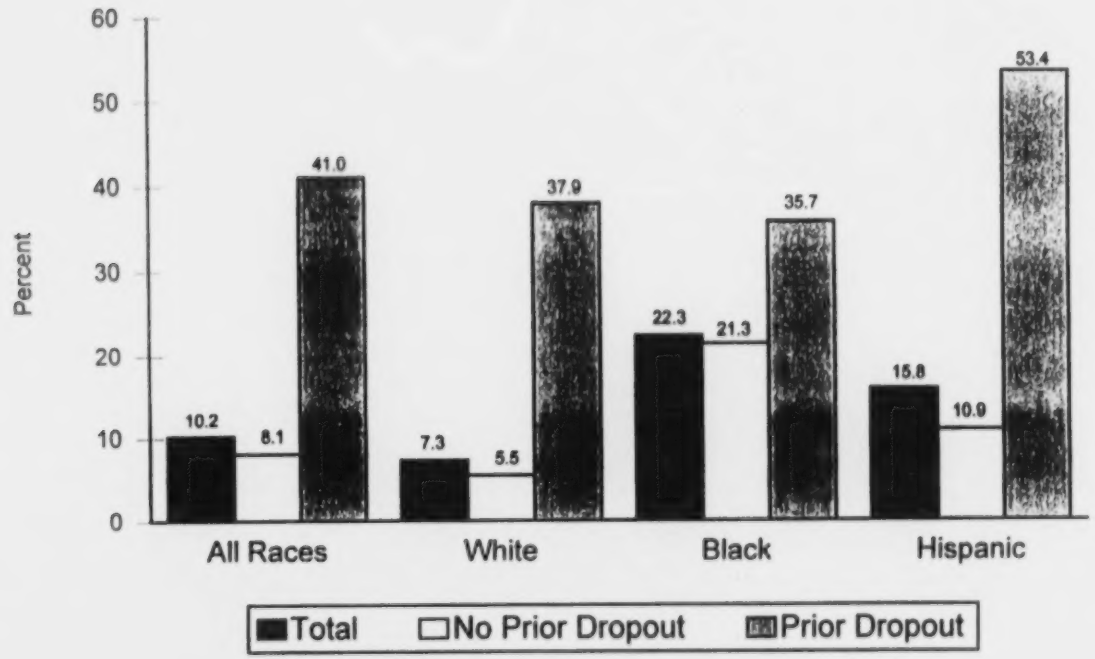


Figure 2

PERCENTAGE OF TEENS WHO HAD A SCHOOL-AGE BIRTH*, TOTAL AND BY RACE/ETHNICITY AND DROPOUT STATUS



* School-age is defined as four years after eighth grade.

Source: National Center for Education Statistics, National Education Longitudinal Study of 1988

TABLE 1: VARIABLE MEANS FOR FAMILY, SCHOOL, AND INDIVIDUAL CHARACTERISTICS, BY RACE/ETHNICITY AND SCHOOL-AGE BIRTH

	Black		Hispanic		White	
	No Birth	Teen Birth	No Birth	Teen Birth	No Birth	Teen Birth
FAMILY BACKGROUND						
Mother's Age at Birth						
Mother's Birth Cohort	3.6	3.0	3.6	3.2	3.8	3.8
Parity	2.6	2.6	2.4	3.5 ***	2.2	2.8 ***
Flag: No Biological Mother	18.8%	37.3% +	15.4%	19.2%	8.7%	15.6% *
Family Structure, SES						
Family SES	-.4	-.5	-.5	-1.2 ***	0.1	-.5 ***
Family Size	4.7	4.8	5.2	5.7 +	4.5	4.4
Intact Family	40.7%	23.1% *	71.0%	48.8% *	71.2%	39.6% ***
Urbanicity						
Rural	21.7%	23.3%	17.3%	19.5%	33.4%	45.0% *
Suburbs	26.9%	34.0%	39.2%	43.3%	47.1%	40.4%
Central City	51.4%	42.7%	43.5%	37.2%	19.5%	14.7%
South	65.2%	62.9%	31.3%	50.3% *	30.2%	40.2% +
FAMILY-SCHOOL						
Parental Involvement	1.3	0.7 ***	1.0	0.7 +	1.2	0.5 ***
Mother's Aspirations	5.0	4.8	4.9	4.3 **	4.9	4.4 ***
SCHOOL						
Ability Group						
Hi Ability Group	26.9%	9.1% ***	25.6%	12.9% +	32.9%	16.0% ***
Mid Ability Group	35.5%	46.4%	39.1%	45.9%	40.5%	48.9%
Low Ability Group	5.7%	10.5%	6.1%	12.5%	6.4%	12.0% *
Ungrouped	31.9%	34.0%	29.2%	28.7%	20.2%	23.1%
School Type						
Catholic or Private School	9.7%	1.1% ***	11.4%	1.4% *	14.7%	3.5% ***
50+% Single Mother Families	33.0%	24.7%	11.6%	19.9% +	6.6%	7.1%
Attend Sex Ed 1+ times a week	18.5%	26.8%	16.2%	7.3% **	15.4%	13.8%
% Minority Students						
0-5% Minority	2.4%	1.2%	4.6%	1.4% **	50.2%	35.1% **
5.01-50% Minority	31.6%	40.1%	34.4%	30.8%	44.7%	52.4%
50.01+% Minority	66.1%	58.7%	61.0%	67.9%	5.1%	12.6% *

Table 1 (continued)

	Black		Hispanic		White	
	No Birth	Teen Birth	No Birth	Teen Birth	No Birth	Teen Birth
% Students Receiving Free Lunch						
0-5% Free Lunch	10.3%	7.1%	18.4%	7.4% **	30.6%	8.8% ***
5.01-50% Free Lunch	52.0%	54.1%	45.4%	39.4%	62.9%	80.3% ***
50.01+% Free Lunch	37.7%	38.7%	36.1%	53.2% *	6.5%	10.9%
TEACHER RATINGS						
2 Teachers Rated Student as Low Ability	6.1%	26.3% *	8.7%	16.6%	6.2%	21.5% ***
INDIVIDUAL						
Religious Involvement	10.5%	8.3%	12.9%	6.0% *	18.4%	4.7% ***
School Involvement						
Grades	3.0	2.4 ***	2.9	2.5 ***	3.1	2.4 ***
Standardized Test Score	46.9	41.0 ***	46.9	41.0 ***	53.5	46.2 ***
Homework Hours	4.1	4.1	4.1	3.6 ***	4.3	4.0 ***
Post-Sec. Education Plans	4.9	4.1 ***	4.5	3.4 ***	4.8	3.7 *
Retained in Grade	13.3%	27.0% *	13.2%	39.8% ***	8.9%	34.6% ***
Dropped Out	5.4%	10.5%	6.5%	39.4% ***	3.8%	29.9% ***

\+ $p < .10$
* $p < .05$
** $p<.01$
*** $p<.001$

Weighted percentages
Significance levels include design effects

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TABLE 2: EFFECTS OF DROPPING OUT AND OTHER VARIABLES PREDICTING THE TIMING OF FIRST BIRTH, BY RACE/ETHNICITY

	Black			Hispanic			White		
	1	2	3	1	2	3	1	2	3
FAMILY BACKGROUND									
Mother's Age at Birth									
Mother's Birth Cohort	1.21 +	1.29 *	1.31 *	1.18	1.16	1.25 +	1.31 **	1.31 **	1.33 **
Parity	0.99	0.98	0.97	1.18 **	1.16 *	1.20 **	1.23 ***	1.24 ***	1.24 ***
Flag: No Biological Mother	5.67 **	7.70 ***	7.97 ***	2.18	1.92	2.50	3.76 **	3.82 **	3.55 **
Family Structure, SES									
Family SES	1.37	1.56 *	1.61 *	0.53 ***	0.63 *	0.66 +	0.63 **	0.81	0.85
Family Size	0.98	1.02	1.02	1.17 *	1.17 *	1.15 *	0.92	0.91	0.90
Intact Family	0.58 +	0.52 +	0.53 +	0.42 **	0.45 *	0.46 *	0.50 ***	0.55 ***	0.55 ***
Urbanicity									
Rural	1.20	0.86	0.90	1.26	1.23	1.17	1.25	1.37	1.43
Suburbs	1.57	1.04	1.08	1.04	0.92	0.88	1.22	1.26	1.30
Central City	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
South	1.19	1.35	1.34	1.28	1.37	1.23	0.97	0.97	0.96
FAMILY-SCHOOL									
Parental Involvement	0.67 *	0.81	0.81	1.02	1.11	1.17	0.82 *	0.84 *	0.84 *
Mother's Aspirations	0.93	1.09	1.09	0.76 *	0.85	0.84	0.87 +	0.99	0.97
SCHOOL									
Ability Group									
Hi Ability Group	0.41 *	0.67	0.68	0.37 **	0.60	0.61	0.80	1.43	1.48
Mid Ability Group	1.12	0.99	0.99	1.46 +	1.57 +	1.64 *	1.09	1.15	1.19
Low Ability Group	1.51	0.64	0.63	1.61	1.48	1.40	1.04	0.80	0.82
Ungrouped	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Contrast Between Low and Hi Ability Group	*			***	*	*			
School Type									
Catholic or Private School	0.14 ***	0.19 **	0.19 **	0.36	0.64	0.69	1.16	1.29	1.30
50+% Single Mother Families	0.72	0.68	0.70	0.93	1.06	0.93	0.83	0.80	0.77
Attend Sex Ed 1+ times a week	1.88 *	2.08 **	2.12 **	0.48 +	0.56	0.59	1.09	1.17	1.15

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Table 2 (continued)

	Black			Hispanic			White		
	1	2	3	1	2	3	1	2	3
% Minority Students									
0-5% Minority	1.08	1.80	1.82	0.55	0.35	0.48	0.32 **	0.37 **	0.38 **
5.01-50% Minority	1.29	1.37	1.37	1.31	1.24	1.43	0.52 +	0.61	0.61
50.01+% Minority	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
% Students Receiving Free Lunch									
0-5% Free Lunch	0.89	1.20	1.23	0.79	0.93	0.90	0.53	0.53	0.55
5.01-50% Free Lunch	0.92	0.95	0.97	0.72	0.84	0.77	1.17	1.12	1.15
50.01+% Free Lunch	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
TEACHER RATINGS									
2 Teachers Rated Student as Low Ability		2.26 **	2.23 **		0.95	0.91		1.12	0.98
INDIVIDUAL									
Religious Involvement		0.64	0.63		0.64	0.66		0.47 **	0.49 **
School Involvement									
Grades		0.53 **	0.53 **		0.87	0.88		0.61 *	0.63 *
Standardized Test Score		0.93 ***	0.93 ***		0.93 ***	0.92 ***		0.98 +	0.98 *
Homework Hours		1.21	1.19		0.79 **	0.79 **		1.06	1.06
Post-Sec. Education Plans		0.75 **	0.75 **		0.83 *	0.85 +		0.89	0.93
Retained in Grade		0.80	0.77		1.10	1.06		1.20	1.13
Dropped Out			1.36			2.12 **			1.94 **
Sample Size	785	785	785	971	971	971	5605	5605	5605
# of Events	134	134	134	127	127	127	303	303	303
Adjusted Chi-Square*	24.18	81.38	76.67	58.16	82.53	83.57	76.85	86.81	96.13
d.f.	25	34	35	25	34	35	25	34	35

+ $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$

*The Satterwhite adjusted chi-square takes into account clustering

Weighted percentages
Significance levels include design effects

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Table 3: The Influence of Time-varying Dropout Variables on the Timing of Motherhood (net of all other variables), by Race/Ethnicity

	Total Sample	Black	Hispanic	White
Time to Dropout	+	0	+	+
Duration Since Dropout	0	0	0	0
Age at Dropout	-	0	-	-

0 = No significant effect
+ = Significant positive effect ($p < .05$)
- = Significant negative effect ($p < .05$)

Appendix: Definition, Range, and Means of Variables, By Race/Ethnicity (continued)					
			Variable Means (weighted)		
Variables	**Definition**	**Range**	**White**	**Black**	**Hispanic**
South	School located in the South (South Atlantic, East South Central, or West South Central states) according to US Census classification (1=Yes)	0-1	30.9%	64.7%	34.3%
FAMILY-SCHOOL INVOLVEMENT					
Parental Involvement	Scale based on whether parents attend or take part in parent-teacher organization meetings, volunteer in school, or attend school meetings, 8th grade (α=.73)	0-4	1.1	1.2	1.0
Mother's Aspirations	Daughter's perception of how far her mother wants her to go in school. (1=Less than high school diploma, 6=Post-college)	1-6	4.9	5.0	4.8
SCHOOL-LEVEL					
Ability Group					
Hi Ability Group	Student attended a high ability Math class in 8th grade (1=Yes)	0-1	31.6%	23.0%	23.6%
Mid Ability Group	Student attended a middle ability Math class in 8th grade (1=Yes)	0-1	41.1%	37.9%	40.1%
Low Ability Group	Student attended a low ability Math class in 8th grade (1=Yes)	0-1	6.8%	6.8%	7.1%
Ungrouped	Student attended an 8th grade Math class that was ungrouped by ability (1=Yes)	0-1	20.4%	32.3%	29.1%

Appendix: Definition, Range, and Means of Variables, By Race/Ethnicity (continued)

			Variable Means (weighted)		
Variables	**Definition**	**Range**	**White**	**Black**	**Hispanic**
School Type					
Catholic or Private School	Respondent attended Catholic or other private school in 8th grade (1=Yes)	0-1	13.9%	7.8%	9.8%
50+% Single Mothers Families	50% or more of 8th grade students in school were from single mother families (1=Yes)	0-1	6.6%	31.2%	12.9%
Attend Sex Ed 1 + times a week	Respondent attended sex education one or more times a week in 8th grade (1=Yes)	0-1	15.3%	20.4%	14.8%
% Minority Students					
0-5% Minority	8th grade school had 0-5% minority students (1=Yes)	0-1	49.1%	2.1%	4.1%
5.01-50% Minority	8th grade school had 5-50% minority students (1=Yes)	0-1	45.3%	33.5%	33.8%
50.01 +% Minority	8th grade school had over 50% minority students (1=Yes)	0-1	5.7%	64.4%	62.1%
% Students Receiving Free Lunch					
0-5% Free Lunch	0-5% of 8th grade received free student lunches (1=Yes)	0-1	29.0%	9.6%	16.7%
5.01%-50% Free Lunch	5-50% of 8th grade received free student lunches (1=Yes)	0-1	64.2%	52.5%	44.5%
50.01+% Free Lunch	Over 50% of 8th grade received free student lunches (1=Yes)	0-1	6.8%	37.9%	38.8%
Teacher Ratings	Two 8th grade teachers rated student as low ability (1=Yes)	0-1	7.3%	10.6%	9.9%

Appendix: Definition, Range, and Means of Variables, By Race/Ethnicity (continued)					
			Variable Means (weighted)		
Variables	**Definition**	**Range**	**White**	**Black**	**Hispanic**
INDIVIDUAL-LEVEL					
Religious Involvement	Student participated as a member or an officer in a religious organization at school in 8th grade (1=Yes)	0-1	17.4%	10.1%	11.8%
School Involvement Grades	Average of student self-reported grades in 4 subject areas (English, mathematics, science, and social studies) in 8th grade (0.5=mostly below D, 4=mostly A's)	0.5-4	3.0	2.8	2.8
Standardized Test Score	Student standardized scores on composite math and English tests administered in 8th grade	31.0-75.8	53.0	45.6	46.0
Homework Hours	Student report of number of hours spent weekly on homework (1=none, 8=21 or more hours)	1-8	4.3	4.1	4.0
Post-Sec. Education Plans	Student reported post-secondary school plans (1=won't finish high school , 6= higher level of school after college)	1-6	4.7	4.7	4.4
Retained in Grade	Student report of ever retained in grade (1=Yes)	0-1	10.8%	16.3%	17.4%
Dropped Out	Student dropped out before study ended (12th grade or equivalent) or prior to pregnancy (1=Yes)	0-1	5.7%	6.6%	11.7%
School-Age Birth	Teen had a birth by 12th grade or equivalent (1=Yes)	0-1	7.3%	22.3%	15.8%
N	Sample Size		5,605	785	971

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Appendix: Definition, Range, and Means of Variables, By Race/Ethnicity					
			Variable Means (weighted)		
Variables	**Definition**	**Range**	**White**	**Black**	**Hispanic**
FAMILY BACKGROUND					
Mother's Age at Birth Mother's Birth Cohort	Mother's year of birth: 1=1929 or earlier, 7=1960 or later	1-7	3.8	3.5	3.5
Parity	Birth order of respondent (1=first born)	1-7	2.2	2.6	2.6
Flag: No Biological Mother	No information on mother's birth year, because no biological mother in household (1=Yes)	0-1	9.3%	22.9%	16.0%
Family Structure, SES Family SES	Socio-economic status composite constructed from base year parent questionnaire, including father's and mother's education level, father's and mother's occupation, and family income. Standardized around a mean of 0 and a standard deviation of 1.	-2.80-2.01	0.1	-.4	-.6
Family Size	Number of family members in 8th grade	2-11	4.5	4.7	5.3
Intact Family	Respondent lived with biological mother and father in 8th grade (1=Yes)	0-1	68.9%	36.8%	67.5%
Urbanicity Central City	School district located in an urban, central city area, according to US Census classification (1=Yes)	0-1	19.2%	49.5%	42.5%
Suburbs	School district located in a suburban area surrounding a central city within a county constituting a Metropolitan Statistical Area (MSA), according to US Census classification (1=Yes)	0-1	46.6%	28.5%	39.8%
Rural	School district located in a rural area outside an MSA, according to US Census classification (1=Yes)	0-1	34.2%	22.1%	17.7%